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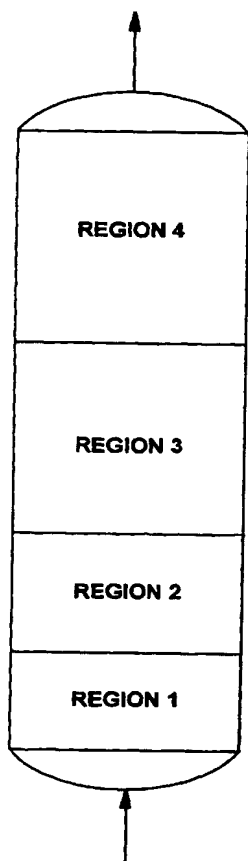
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(54) Title: PROCESS AND APPARATUS FOR HYDROGEN PURIFICATION



(57) Abstract: This invention discloses an optimum set of adsorbents for use in H<sub>2</sub>-PSA processes. Each adsorbent bed is divided into four regions; Region 1 contains adsorbent for removing water; Region 2 contains a mixture of strong and weak adsorbents to remove bulk impurities like CO<sub>2</sub>; Region 3 contains a high bulk density (>38 lb<sub>m</sub>/ft<sup>3</sup>) adsorbent to remove remaining CO<sub>2</sub>; and most of CH<sub>4</sub> and CO present in H<sub>2</sub> containing feed mixtures; and Region 4 contains adsorbent having high Henry's law constants for the final cleanup of N<sub>2</sub> and residual impurities to produce hydrogen at the desired high purity.

WO 2004/058630 A2



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#### Declarations under Rule 4.17:

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- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for the following designations* AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

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